DIGITALIZATION AND AGILITY OF ENTERPRISES AND BANKS: IT COMPETENCIES OF MANAGERS AND VIRTUAL TEAM MEMBERS

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ABSTRACT

In the conditions of a tremendous industrial advance in information and communication technologies today and in the full swing of the world economic crisis, the chances of industry and universities to survive are rather thin unless they undergo necessary changes. These changes are reflected in the interconnection of the social environment, universities and industry, which is a precondition for building a knowledge-based economy. The aim of our research is to define the extent of collaboration competency within the social network. It helps a more objective assessment in selecting prospective team members. The employee with maximum knowledge required for the project, one that can ensure a high degree of collaboration through a social network is appointed project manager. On the basis of these results a competent virtual team can be assembled, capable of effectively solving the tasks set before them.

Keywords: Organizations, Banks, Competencies, Digitalization, Managers, Virtual Teams.

INTRODUCTION

Competency is the capability of an individual verified by a written document and stating the fact that this individual is capable to perform a certain occupation. It is important to note that, in the course of one's education and training for an occupation, one develops the competence in accordance with the standards set for that occupation (Radović, 2014).
Most competencies can be classified in two categories:

1. Competencies successfully applicable in a large number of various tasks (general competencies);
2. Knowledge, skills or strategies suitable for a specific organization which requires particular adapting.

Researchers Allen and Van der Velden (Allen & Velden, 2005) produced a methodology under which professionals with higher education are expected to develop at least five areas of general competencies:

1. Professional expertise: higher education graduates are expected to become experts in their professional field;
2. Functional flexibility: implies that higher education graduates must be able to take up new challenges and quickly acquire new knowledge;

3. Innovation and knowledge management: higher education graduates are expected, in addition to successful carrying out of their tasks, to create an environment for knowledge-based innovation management;
4. Mobilization of human resources: higher education graduates are expected to have the ability to mobilize all available human resources and guide them in a desired direction;
5. International orientation: in view of the globalization processes, higher education graduates are expected to have strong international orientation.

According to the most frequently used definition (Argyris, 2001), competency is defined as a synthesis of knowledge acquired through formal learning and skills created through work at a workplace and social life in daily experience. The European Commission defines competency as the ability to use effectively knowledge, experience and qualifications. It is connected with the productivity-related requirements of a profession, where competency is defined as a combination of knowledge, skills and abilities which favour enterprise's productivity increase.

Through a series of varied measures, each enterprise can develop a base of its competencies by acquiring appropriate competencies outside the enterprise, and by developing the human resources already employed in its organization. These investments will be efficient only if used to target market needs. To that effect, also a 'competency chain model' is used, since it directs attention precisely to the activities undertaken by enterprises to improve their competency base in two areas (Radović-Marković, 2018 a):

1. Developing internal competencies, which include measures undertaken by a firm to develop and advance the status of the existing competencies of the already employed human resources.
2. Acquiring competencies outside the enterprise by purchasing them as varied external competencies lacking in the enterprise, which are very important for achieving better firm characteristics.

LITERATURE OVERVIEW

Information and communication technologies were the subject of significant attention of both researchers and theorists during the last decade. Since mid-1980, the strategic impact of information technology has been growing (Bassellier et al., 2003). Following this trend, the theorists have been focusing on integrating IT professionals and business managers to create information technology abilities and effectively use and implement them in organizations (Bassellier et al., 2003) (Rockart et al., 1996). The theorists of the resource-based theory suggest relevant steps in the area of linking the human factor with information technologies to create enterprise's sustainable competitive advantage at the market (Barney, 1991) (Mata et al., 1995) (Ross et al., 1996)

The most eminent theoretical overviews draw attention to the importance of human capital in creating the sustainable competitive advantages of enterprises and banks through modern information and communication technologies. Most of the resource-based theorists advocate uniting the human resources factor with information technologies in building the sustainable competitive advantages of enterprises and banks (Barney, 1991) (Mata, et al., 1995) (Ross et al., 1996).

At personal level, employees should be educated in the field of information technologies, ready to facilitate introduction of information technologies in enterprise's daily processes by means of their skills, and furthermore, in doing that they should be provided with technological hardware and devices. The knowledge of information technologies implies wider technical knowledge and skills related to objects, because that way it enables introducing information technologies into enterprise's daily activities and processes (Tippins & Sohi, 2003). At that,

information technology knowledge, skills and operations can exist in an enterprise only if that enterprise prepares a platform for information technology introduction. Information technology objects refer to the availability of hardware, software and human resources-employees and managers. Possession of the information technology knowledge, operations and objects also guarantees enterprise's readiness to acquire, apply and achieve integral functional influence of information technology in cooperation with other resources and as a support to business processes in creating additional value (Bessant et al., 2001).

In addition to education, some authors necessarily include experience as an integral part of information technology competencies (Rockart et al., 1996), (Bassellier et al., 2003). The experience in applying information technologies refers to the activities undertaken in an enterprise in the field of information technology projects and experience in managing those projects. According to numerous papers by various authors, competency-related experience (Tippins & Sohi, 2003) will probably influence the acquiring of IT skills, as well as the advancement of competencies and resources for future work of the employees and enterprise. That is why information technology experience is expected to support ICT knowledge and to increase the readiness of employees to efficiently introduce information technologies on the one hand, and readiness of management to increase the investment in ICT tools and equipment on the other hand (Foss & Knudsen, 2000). Discussions on the best practice in education and training for acquiring IT knowledge point out that it is the main precondition for building individual and team competencies in the field.

The next resource-based theory framework insists that (Lockett & Thompson, 2004) an enterprise intending to achieve its objectives on the market, in particular the international, must possess resources that are: valuable, rare and difficult to imitate and substitute (Barney, 1991), in order to set a barrier for the competitors. IT skills and employees' willingness to use ICT, devices and tools can create new special values in an enterprise. Special emphasis is placed on the importance of managerial skills in information technologies (Rockart et al., 1996), starting from the viewpoint that these skills can potentially influence competitiveness growth of the enterprise. In the industry-related studies, it is pointed out that the sector of ICT users which comprises industries and intensive users of information and communication technologies has significantly higher competencies than the industries not using IC technologies. A number of researches conducted in the USA, Australia and United Kingdom show that the enterprises and related service activities where modern IC technology tools and systems are intensely implemented have significantly higher productivity than those not using ICT (OECD, 2010). The European Union also records higher productivity growth with enterprises intensely using information technology in their operation.

European E-Competence Framework IT Competencies of Managers

The abilities which require effective use of the applications of ICT systems and devices are unimaginable without a strong support of an individual, employee and manager. Generally speaking, this can be understood as computer literacy, which critically implies using the information technologies while working, relaxing, learning and communicating. From the point of view of workforce, information and communication technology users apply the systems and tools as a support to their work. The skills of ICT users imply using the tools of general software and specialist software in supporting enterprise's business functions.

The e-business skills, or e-leadership skills as they are also called, imply the abilities needed to use the opportunities provided by ICT, primarily internet, and to ensure a more efficient and effective performance in various types and sizes of enterprises. Digitalization in banking management includes the products and services that bank clients can usually access using their mobile devices or computers or generally without human intervention from the bank. From user perspective, digitalization offers huge advantages in the form of ease, speed and multiple ways of access and change of paradigm in the engagement.

The starting point of each virtual organization is a specific task or product whose solution requires a combination of individual means from the network which, in turn, constitutes the foundation of another virtual organization. Usually the completion of each task requires engagement of only a specific part of the network. Once configured, each participant in such an organization contributes to problem solving within their own competencies and qualities.

This implies using the opportunities afforded by the new ways of managing the operation, administrative and organizational processes, and establishing new firms. The following chart provides an overview of the basic skills according to the European Union definition.

The European e-Competence Framework is a contribution to the growing significance of information and communication technologies (hereinafter ICT) at the global level, and to the large potential of this sector in creating employment policy. It is a general framework which enables ICT professionals to describe and develop their abilities, and enterprises and their employees to identify those who have or can improve the required skills. The European e-Competence Framework (EU e-Competence Framework-e-CF) provides a description of professional skills for ICT use, a general framework of competencies and levels that can be understood across Europe and used internationally. The framework is intended for implementation in enterprises, for users or providers of ICT services and hardware, managers and human resource departments, education institutions and training bodies, as well as other organizations of the private and public sectors.

The e-CF was developed in 2008 through a collaboration process between experts and interest groups from various countries. The application of the European e-Competence Framework can be of use to a growing number of those wishing to implement it in their business practice.

The experience in using e-CF in numerous applications shows the quality tool which facilitates processes connected to ICT competencies, qualifications and human resources development' (Radović-Marković et al., 2018a).

There is a general agreement among researchers that e-skills are becoming increasingly important for the advancement of competitiveness, productivity and innovation, and for workforce employment and professionalization. Also, they contribute to being better informed, communicating more easily and solving problems faster. To that effect, there is a great need to ensure knowledge, skills and competencies with managers and IT specialists in this field, but also with users, in order to be able to influence fulfilling the highest global standards which are continually improving through the process of effective lifelong learning.

IT Competencies of Managers

The ever-growing competition and globalization have put innovation in the spotlight of industrial development. The lack of capacities for successful management of uncertainty risks

particularly jeopardizes small firms. The model of managerial IT competencies consists of two dimensions: knowledge and experience. The role of entrepreneurs in firms, in particular those small (0-49 employees) which are predominating, is described in literature as the one of leadership, management and coordination, but also of an entrepreneur, such as undertaking new combinations and responsibilities, risks and innovation, all in order to achieve the strategic objectives of the enterprise (Drucker, 1999).

The choice of product, process or market innovation is frequently defined by the market at which the firm is operating, but it is closely linked to the role of managers and their impact on enterprise's innovation strategy.
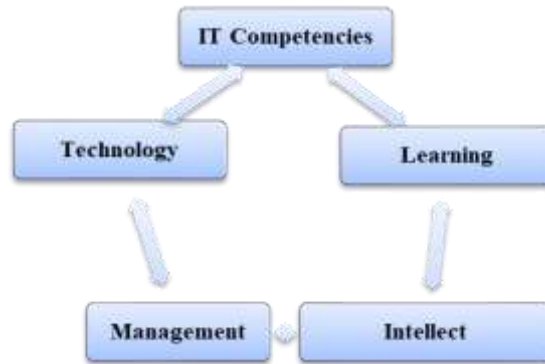
FIGURE 1
MODEL OF MANAGERIAL IT COMPETENCIES

Managerial IT ((Figure 1: Source: Bassellier, et al., (2003) (Source: Bassellier, et al., (2003)) competencies must include the following areas of IT competencies: technology, engineering and management, intellect and learning. Managers, the creative leaders, can use a wide range of new, technologically supported options in formulating their strategies, which they are increasingly using in the operation in order to move toward the changes rather than merely responding to them. That is why, before the IT functions get from the operator into operation, it is necessary to create the internal abilities of managers and the ambiance for continuous learning in order to expand innovative abilities in business by using IT tools (Bessant et al., 2001), (Barrios, 2007).

The model for creating links between ICT resources and processes is given in several stages:

1. Readiness - the stage of preparation of technical, commercial and social infrastructure for an ICT initiative of e-commerce.
2. Intensity - the state and stage of e-commerce use, volume, value and nature of transactions. It indicates who is using e-commerce and to what extent, leading sectors and applications.
3. Impact - it shows changes in the behaviour of using an ICT project, application in e-commerce, as well as the results, specific costs and benefits of the ICT project. It indicates the value added created by e-commerce use.

The correlation between various types of changes in organization hints at changes happening due to the enterprise's use of e-functions. In this, numerous examples from Europe show the competitive advantage of implementing new technologies held by the employees with IT education, because they adopt them as new ideas faster than the others. Very high obstacles faced by SMEs in penetrating a new market have been facilitated by wider use of IC technologies, which reduces the costs, increases productivity and profitability and additionally motivates workforce for learning and competitiveness growth.

ICT is part of the information technology sector and telecommunication activity. But these areas include also other information inter-sectors, which classifies them in the information society, where certain activities overlap and mutually touch, and jointly impact firm performance. The European Union has given boost to its strategic intents towards construction of the information society through sub-strategies covering: EU digital agenda, innovative Europe, new skills and jobs, putting youth at the forefront of development by 2020, as well as ICT development in the new industrial policy. Investments in ICT contribute to general improvement of enterprise abilities (OECD, 2010) through process of collaboration on innovations, which are slower than technological improvements. The measure of economic impact and benefits of enterprise investments in information and communication technologies is often shown through calculations, capital productivity and quality improvement. Intensive ICT users differ from others, and their number keeps growing.

Agility

It was believed in the past that the agility and response from strategy flexibility can be achieved by sophisticated technologies, such as computer integrated manufacturing (CIM) (Ioundt et al., 1996). However, recent research results have shown that manufacturing flexibility depends much more on people than on technologies (Apton, 1995). In Apton's opinion, although computer networking can provide important competitive advantages, the results of his study showed that operational flexibility depended on the extent and manner of managers' communication using computers. It was concluded that achieving manufacturing flexibility required development and maintenance-highly qualified, technologically competent and adaptable workforce able to handle various conditions and professional circumstances' (Ioundt et al., 1996).

Contemporary manufacturing requirements have shown that agility cannot be achieved without harmonizing employee's knowledge and skills (Dove, 1993; Forsythe, 1997; Nagel & Dove, 1991; Plonka, 1997; Radović Marković, 2018b). There is a widespread belief that agile workforce may provide a wide range of benefits, such as quality improvement, better customer service and faster mastering of new knowledge (Herzenberg et al, 1998; Hopp & Van Oien, 2004). Changes from traditional manufacturing approach to the agile will set new requirements for the workforce in various fields of operation. In his work, Pinochet (Pinochet et al., 1996) proved that introducing advanced manufacturing technologies impacted both the workplace and the relevant workforce. Based on these findings, Gunasekaran (Gunasekaran, 1999) proposes that workforce in an agile enterprise must have different skills from the workforce in traditional systems, because it needs to meet the following working conditions:

1. Existence of closer interdependence among the activities being performed,

2. Skills possessed by the employees should be above average,
3. Expert handling of devices since their malfunctions produce high costs,
4. Output depends much more on employees' skills and on their mental effort rather than physical effort,
5. Continual change and development,
6. High investments per employee,
7. Employees are responsible for a product or entire process

Workforce can achieve some of the above defined agile work requirements based on three types of behaviour- proactive, adaptive and generative: (Dyer & Shafer, 2003)

Proactive - the behaviour consists of two aspects: initiative and improvisation. Proactive initiative is active search for opportunities to contribute to organizational success and take the lead in pursuing those opportunities that appear promising. Proactive improvisation requires devising and implementing new and creative approaches to pursuing opportunities and dealing with threats.

Adaptive behaviour requires the possibility of multiple various workplaces nurturing multi-functionality (Hopp & Van Oyen, 2004). Also, multi-functionality does not result in work saturation and fatigue or repetitive stress. However, there has been no empirical research aimed at identifying the effects of employee multi-functionality on production agility or business performance.

Generative- that employees must be educated simultaneously within a multi-qualification framework through various training programs and actively share information, knowledge and establish spontaneous collaboration.

Agile organization requirements have led to the conclusion that agility cannot be achieved without harmonizing employee knowledge and skills. New forms of labour, new technologies and new requirements set before the employees have led to gradual redefining of education and to directing individuals and education institutions in that direction. Human resource training for certain tasks is conducted primarily by expanding the employee's knowledge and competencies for best possible responding to work tasks (Radović-Marković 2014; Radović Marković et al., 2017; Radović Marković, 2018 b).

Banking Sector Agility

Awareness is raising also in the banking sector that the time between defining the requirements and creating the product should be the shortest possible, in order to avoid too long a period of product creation by the team based on the requirements received from a user of banking sector services. Namely, prolonged product creation increases the risk of it no longer meeting the real needs and requirements of service users. In order to secure this short period until launch into the market, it is best to design and develop products gradually by applying the agile manner of project management. Through this method, planning and testing will be done continually, thus enabling the final product to be as competitive as possible.

There is a growing awareness among banks that investments in digital technologies can benefit service users. In order to fully integrate and put the focus on digitalization, it is indispensable that banks create a digital expert team in parallel with appointing a digital expert to various project teams. This way, digital experts will be part of a special working group, to be supported by the central digital core which is directing the entire enterprise towards a long-term

digital incorporation. The mission of these experts is to encourage digital innovation and lead key initiatives.

The future of financial service industry will depend on the banks which will redefine their business model. It should be based on a multiannual program of changes focused on client requirements. Namely, clients are comparing the services of their bank with the integrated experiences gained in other fields of their life and expecting similar experiences during all their financial interactions, regardless of the channel. Therefore, financial institutions must transform from vertical structures and product-focused architectures into horizontal client-oriented organizations. A bank wishing to transform into an agile bank will have to reflect holistically on several dimensions, including operationality and development agility. The success in this effort requires software solutions which support all types of payments and enable process integration in real time. This type of solution supports providing a joint banking platform with transactions and offers a unique network store of data for advanced analytics.

CONCLUSION

Enterprise agility, as well as global economy requires workforce flexibility. Enterprises unable to have it as their own resource, reach for external human resources by forming virtual work teams. One of the proposed models for assessing virtual team members and team leader is when virtual teams are formed for implementation of a scientific or technological project in collaboration between a virtual university and a virtual enterprise. The calculation of coefficients of personal competency and collaboration competency produces the proposed competent virtual team members. The person with the highest weighted average of knowledge competency should be appointed leader of the virtual team.

Contemporary research shows that workforce agility can be acquired through 'employee cross-training', since cross-trained employees are much more flexible than other employees. Cross-training can also facilitate work due to less fatigue or repetitive stress. However, it should be noted that there is no empirical research examining the effect of cross-training on business performance and productivity. Therefore, this examination of ours is only an introduction into new and detailed examinations of this issue.

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